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JOURNAL ARTICLE

Response of circulating gonadotropin levels to GnRH agonist treatment in prostatic cancer

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Luteinizing hormone (LH), follicle-stimulating hormone (FSH), and testosterone (T) responses to 6-month treatments with a gonadotropin-releasing hormone (GnRH) agonist (buserelin) and subsequent orchiectomy were studied in patients with advanced prostate cancer. For treatments, either an intranasal (600 micrograms, 3/day, n = 8) or subcutaneous depot preparation (6.6 mg every other month, n = 5) were used. A third group of patients received intranasal buserelin (400 micrograms, 3/day, n = 12) for 35 months. LH and FSH were measured using radioimmunoassay (RIA) and a sensitive (0.04 IU/L) immunofluorometric assay (IFMA). In addition, selected samples were analyzed for bioactive (bio) LH. The RIA-LH levels decreased 70% with intranasal treatment. In contrast, when monitored by IFMA, the reduction was greater than 90%: 0.2 to 0.3 IU/L with intranasal and 0.044 to 0.052 IU/L with depot treatment (P less than 0.01). Gonadotropin suppression was stable up to 35 months. Bio-LH and IFMA-LH levels decreased in parallel during treatment, with no apparent changes in the bio/immuno ratio. FSH levels were suppressed temporarily during the treatments. After castration and cessation of buserelin treatment, serum LH and FSH increased rapidly in the intranasal treatment group but only marginally during 3 months in the depot group. Serum T reached the castrate range when IFMA-LH decreased below 0.5 IU/L. A further decrease in LH (less than 0.1 IU/L) still suppressed the intratesticular T concentration measured after orchiectomy. In conclusion, IFMA offers an improved method to monitor the antigonadotropic effect of GnRH agonist treatment. The results emphasize the necessity of profound LH suppression to achieve maximal inhibition of testicular androgen production.